

Claims

1. A method for the production of a device comprising the steps of:
 - (a) providing a solution comprising dissolved osteoinductive protein;
 - (b) contacting the solution of step (a) with a carrier containing a surface of metal or a metal alloy;
 - (c) allowing coating of the surface of said carrier with said dissolved protein; and
 - (d) drying of the coated carrier obtained in step (c),wherein steps (b) to (d) are carried out under a reduced concentration of oxygen.
2. The method of claim 1, wherein steps (b) to (d) are carried out under an oxygen concentration of less than 10 vol% oxygen.
3. The method of claim 1 or 2, wherein steps (b) to (d) are carried out at a temperature below 25°C.
4. The method of any one of claims 1 to 3, wherein said metal or metal alloy is titan or a titan alloy.
5. The method of claim 4, wherein the titan alloy is a titan alloy containing at least 50 % titan.
6. The method of claim 4 or 5, wherein the titan alloy is a Ti-Al-V-alloy, a Ti-Al-Fe alloy, a Ti-Al-Nb-alloy or a Ti-Mo-Zr-Al-alloy.
7. The method of claim 6, wherein the Ti-Al-V-alloy is Ti6Al4V.
8. The method of any one of claims 1 to 7, wherein the coating is carried out by dipping the metallic surface into said protein solution.

9. The method of any one of claims 1 to 7, wherein the coating is carried out by dropping said protein solution onto the metallic surface.
10. The method of any one of claims 1 to 7, wherein the coating is carried out by spraying said protein solution onto the metallic surface.
11. The method of any one of claims 1 to 10, wherein the drying is achieved by vacuum drying.
12. The method of any one of claims 1 to 10, wherein the drying is achieved by freeze drying.
13. The method of any one of claims 1 to 10, wherein the drying is achieved by evaporation at room temperature in an inert gas stream.
14. The method of any one of claims 1 to 13, wherein said osteoinductive protein is a member of the TGF- β family.
15. The method of claim 14, wherein said member of the TGF- β family is a member of the BMP subfamily.
16. The method of claim 15, wherein said member of the BMP family is BMP2 or BMP7.
17. The method of claim 14, wherein said member of the TGF- β family is a member of the GDF subfamily.
18. The method of claim 17, wherein said member of the GDF subfamily is GDF-5.
19. The method of any one of claims 1 to 18, wherein said device is free of toxic substances.

20. The method of any one of claims 1 to 19, wherein said solution allows the dissolution of said protein for a time sufficient for homogenous coating of said metallic surface of the carrier.
21. The method of any one of claims 1 to 20, wherein said solution allows a concentration of said osteoinductive protein of more than 0.5 mg/ml.
22. The method of claim 21, wherein said solution has an acidic pH.
23. The method of claim 22, wherein said acidic solution contains HCl, acetic acid, citric acid or succinic acid.
24. The method of claims 22 or 23, wherein the concentration of the acid is less than or equal to 100 mmol/l.
25. The method of any one of claims 1 to 24, wherein the solution is saturated with an inert gas.
26. The method of claim 25, wherein the inert gas is nitrogen, argon or helium.
27. The method of any one of claims 1 to 26, which is carried out in a compartment with a controlled atmosphere and humidity.
28. A device which is obtainable by the method of any one of claims 1 to 27.
29. A pharmaceutical composition comprising the device which is obtainable by the method of any one of claims 1 to 27.
30. Use of the device which is obtainable by the method of any one of claims 1 to 27 for the preparation of a pharmaceutical composition to be used for an accelerated osseointegration and new bone formation.
31. The use of claim 30, wherein the accelerated osseointegration and new bone

formation is to be used for the treatment of traumatic, malignant or artificial defects.

32. The use of claim 30, wherein the accelerated osseointegration and new bone formation is to be used for the treatment of dental defects.
33. The use of claim 30, wherein the accelerated osseointegration and new bone formation is to be used for the treatment of hip, elbow, spine, knee, finger or ankle joint.
34. A kit comprising the device which is obtainable by the method of any one of claims 1 to 27.